TROPICAL RAINFALL MEASURING MISSION

August 30, 1999 - September 5, 1999
DOY 242 - 248
Day of Mission 641 - 647

TRMM MISSION OPERATIONS

- TRMM is flying in the +X Forward direction as of 99-245, at 21:30:58z.
- The next Yaw maneuver is scheduled for September 27th (99-270).
- Delta-V maneuver #121 is scheduled for September 9th (99-252) using the LBS thrusters.
- The Beta angle range for DOY 249 to 255 is 11.6° to 35.1°.

TRMM SUBSYSTEM OPERATIONS

Attitude Control System

Delta-V maneuver #119 was successfully conducted on 99-243 at 15:46:44z and 16:32:31z, for durations of 43.5 and 26.875 seconds respectively, using the ISP thrusters. The off-modulation of the -Pitch thruster (#6) was 35.6% and 33.0% respectively (64.4% and 67.0% on time). The remaining fuel is 697.213 kg, and the final apogee and perigee height is 354.86 km x 347.31 km.

Delta-V #119 was the third maneuver out of 43 in which ACS TSMs #4 and #7 threshold #2 failed (Solar Array sensed/commanded position difference of 0.51° for two minutes). This was the original FDC threshold which placed the spacecraft in Sun Acq mode on 99-003 following several weeks at the new 50° software stops for the solar arrays. The new limit for FDC tests #112 and #113 was changed to 12° on 99-040, and TSMs #4 and #7 were created and installed on 99-049 to notify the ground when thresholds of 0.51°, 5°, and 10° are crossed. In this case, it took 7 minutes 18 seconds (99-243/15:53:21-16:00:39z) for the sensed position to reach within 0.51° of the commanded position and an additional 1 minute 9 seconds for the solar arrays to reach the final position of 50°. At the time the TSMs failed, the arrays were still 2.9° from the commanded position. The TSMs were reset as part of the daily S/C ATS load.

A 180° Yaw maneuver from -X forward to +X forward was performed on 99-245 at 21:30:58z.

The TDRS EPVs were uplinked on 99-246 and all passed continuity using the new ACS System Table #85 (Ephermeris Limits). CCR #035 (creation of Table #85) is in the process of being closed and as part of the closing process, the new table will be committed to EEPROM.

Delta-V maneuver #120 was successfully conducted on 99-247 at 15:50:20z and 16:34:39z, for durations of 49.375 and 24.0 seconds respectively, using the LBS thrusters. The off-modulation of the -Yaw thruster (#1) for burn 1 was 92.7% (7.3% on time). The off-modulation of the +Pitch thruster (#2) for burn 1 and 2 was 74.4% and 74.5% respectively (25.6% and 25.5% on time). The remaining fuel is 695.486 kg, and the final apogee and perigee height is 354.73 km x 347.50 km.

Flight Data System (FDS)/Command & Data Handling (C&DH)

The frequency standard continues to drift in the negative direction. The frequency standard offset is currently set to x'76F' with a current drift rate of -1.09 μs/hr. The current UTCF value is 31535996.859820 sec with a current drift value of -191 μs.

The MS task registered 'Not Present' on 99-242 at 18:02:32z due to a large dataset release.

The flywheel dwell value incremented to x'10D' on 99-243 at 15:14:52z.

A Q-Channel restart occurred on 99-244 at 06:20:26z.

Reaction Control Subsystem (RCS)

The RCS subsystem performed nominally during this period. See the ACS section for specific Delta-V information.

Power Subsystem

The Power subsystem is operating nominally.

Electrical Subsystem

The Electrical subsystem operated nominally during this period.

Thermal Subsystem

The Thermal subsystem operated nominally during this period.

Deployables Subsystem

The Deployables subsystem performed nominally during this period.

RF/Communications Subsystem

The RF/Communications subsystem performed nominally during this period.

A generic late acquisition occurred on 99-244 during the 19:10z event on TDE/SA1 (Late Acq #38). All data was recovered.

SPACECRAFT INSTRUMENTS

CERES

CERES personnel are developing a plan for operating the instrument with the +15 V DAA anomaly. The CCR which involves creating and testing TSMs to monitor the CERES current is expected to be closed out by the end of September.

The next instrument power-on event for calibrations is expected at the end of September.

LIS

LIS performed nominally during this time period.

PR

PR performed nominally during this time period. The list of Internal Calibration times in which PR was not radiating is listed below:

1999:242:08:01:19 - 08:02:41z
1999:242:16:03:03 - 16:05:10z
1999:243:14:51:00 - 14:53:12z
1999:244:07:10:19 - 07:13:47z
1999:244:15:13:57 - 15:16:04z
1999:245:14:02:36 - 14:04:46z
1999:246:06:20:02 - 06:25:07z
1999:246:14:25:19 - 14:26:56z
1999:247:13:13:00 - 13:15:10z
1999:248:05:31:16 - 05:35:13z
1999:248:12:01:44 - 12:03:58z

TMI

TMI performed nominally during this time period.

VIRS

VIRS performed nominally during this time period.

VIRS Solar Calibrations were performed on 99-242 at 08:03:46z and 11:09:16z and 99-246 at 00:34:22z and 01:53:50z. These calibrations were performed in shadow to determine if thermal leaks are affecting science. The calibrations requested on 99-246 were done due to inaccuracies in the planning aid used on scheduling the first set.

The Cold Stage temperature reached a maximum of 113.7 °K during the passing of beta angle 0°.

GROUND SYSTEM

Y2K testing has been completed on string 3. String 3 operational readiness testing will be performed after completion of rollover testing. String 2 remains the prime Mission Planning string for normal spacecraft operations.

Testing continues with the new FORMATS R8B5V1, which contains fixes for FTP/gatekeeper compatibility and 5 digit orbit numbers (planning aid mod) among others.

On 99-243, CSC notified the FOT 30 seconds into the 16:28z pass that TDRS 171's ADPE had failed at 16:17z and the event would have to be deleted (Event #119). The next pass was quickly extended by the TRMM MP to make up for lost recorder dump time. This problem posed potential risk to the spacecraft because neither of the Delta-V burns were in real-time and the mid-burn verification was not possible due to the 16:28z event deletion. If there had been a problem with first burn, the FOT would have had no knowledge of the anomaly and no way of aborting the ATS before the second burn took place.

The MOC experienced several late acquisitions on TDE and TDW (~10 minutes each) during the time span of 244/20:00z to 245/00:00z (Event #120 and TTR# 21295). The TRMM FOT had to

perform two blind acquisitions and perform non-routine data storage operations to prevent a recorder overflow. The problem was attributed to TRMM vector at WSC which did not accurately model the Delta-V from the previous day. The TRMM vectors at WSC are updated in four hour increments, and after four hours the problem did not reoccur. Data is play backed from WSC to PACOR II to recover data not collected the first time.

During the event scheduled at 14:11:21z on 99-245, the Q-channel and NCC messages dropped out (Event #121 and TTR #21300). The CD manager was notified and a reset of the PTP 1 was done, it only cleared the problem for 30 seconds. PACOR II later confirmed they had a dropout of data. The problem was eventually attributed to router problems and the temporary data after the PTP reset was only a coincidence. PACOR II's router problem was not fixed as quickly as the TRMM MOC problem, so a tape playback from WSC was necessary to recover all data.

Before the TDW 12:53z event on 99-246, the PA reported that a bad TRMM EPV vector may have been used at WSC, since other users were experiencing problems. The PA recommended that a switch to TDRS 171 should be made (Event #122). There was no time available on 171, but a backup event was scheduled at 13:23z on TDS. Also the next two TDW events at 14:30z and 16:07z were moved to 171. The TDW 12:53z event was nominal, so the added TDS event was deleted.

During the time frame of 07:32:40z to 07:42:15z on 99-247, the MOC lost the capability to send GCMRs and to receive ODMs. The FOT had a coherency event scheduled during this time, so the CSC had to build and send the proper GCMRs.

The FOT Mission Planner had to regenerate the Delta-V (#120) load three times due to the post-burn EPV containing four-day old data (Event #124).

Event Reports

#119: WSC H/W Failure - Pass Deleted at Scheduled AOS (see Ground System).
#120: Invalid Post-Maneuver TRMM Vector at WSC - Late Acquisition (see Ground System).
#121: Router Problems - Q Channel and NCC Dropout (see Ground System).
#122: Bad TDW Vector at WSC (see Ground System).
#123: ODM and GCMR Capability Temporarily Lost (see Ground System).
#124: Bad Delta-V Command File (see Ground System).

Generic Late Acquisition Reports (for TTRs 19639)

38: TDE/SA1: 99-244 at 19:10z event; 25 seconds late.

New Anomaly

No new Anomaly reports have been opened during this period.

Recurring Open Anomalies

No recurring Anomalies occurred during this period.

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